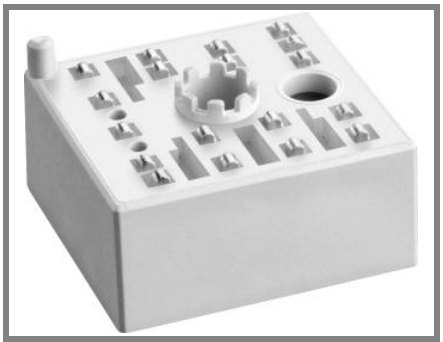
SKiiP 03NAC066V3

CONVERTER, INVERTER, BRAKE



MiniSKiiP® 0

3-phase bridge rectifier + 3-phase bridge inverter

SKiiP 03NAC066V3

Target Data

Features

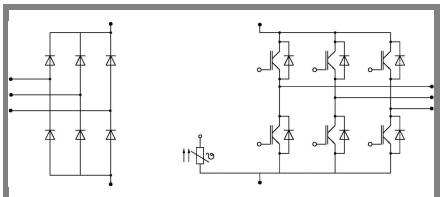
- Trench IGBTs
- Robust and soft freewheeling diodes in CAL technology
- Highly reliable spring contacts for electrical connections
- UL recognised file no. E63532

Typical Applications

- Inverter up to 5,6 kVA
- Typical motor power 3,0 kW

Remarks

- Case temperature limited to T_C = 125°C max.
- Product reliability results are valid for T_j=150°C
- SC data: $t_p \leq 6$ µs; $V_{GE} \leq 15$ V; T_j = 150°C; V_{CC} = 360 V
- V_{CEsat}, V_F = chip level value



NAC

Absolute Maximum Ratings		T_s = 25 °C, unless otherwise specified	
Symbol	**Conditions**	**Values**	**Units**
IGBT - Inverter			
V_{CES}		600	V
I_C	T_s = 25 (70) °C, T_j = 150 °C	24 (17)	A
I_C	T_s = 25 (70) °C, T_j = 175 °C	27 (20)	A
I_{CRM}	t_p = 1 ms	30	A
V_{GES}		± 20	V
Diode - Inverter			
I_F	T_s = 25 (70) °C, T_j = 150 °C	24 (16)	A
I_F	T_s = 25 (70) °C, T_j = 175 °C	28 (21)	A
I_{FRM}	t_p = 1 ms	30	A
Diode - Rectifier			
V_{RRM}		800	V
I_F	T_s = 70 °C	35	A
I_{FSM}	t_p = 10 ms, sin 180 °, T_j = 25 °C	220	A
i^2t	t_p = 10 ms, sin 180 °, T_j = 25 °C	240	A^2s
I_{tRMS}	per power terminal (20 A / spring)	20	A
T_j	IGBT, Diode	-40...+175	°C
T_{stg}		-40...+125	°C
V_{isol}	AC, 1 min.	2500	V

Characteristics		T_s = 25 °C, unless otherwise specified			
Symbol	**Conditions**	**min.**	**typ.**	**max.**	**Units**
IGBT - Inverter					
$V_{CE(sat)}$	I_{Cnom} = 15 A, T_j = 25 (150) °C	1,1	1,45 (1,65)	1,85 (2,05)	V
$V_{GE(th)}$	V_{GE} = V_{CE}, I_C = 1 mA		5,8		V
$V_{CE(TO)}$	T_j = 25 (150) °C		0,9 (0,85)	1 (0,9)	V
r_{CE}	T_j = 25 (150) °C		40 (57)	60 (80)	mΩ
C_{ies}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		0,86		nF
C_{oes}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		0,18		nF
C_{res}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		0,12		nF
$R_{CC'+EE'}$	spring contact-chip T_s = ( )°C				mΩ
$R_{th(j-s)}$	per IGBT		1,8		K/W
$t_{d(on)}$	under following conditions		20		ns
t_r	V_{CC} = 300 V, V_{GE} = ± 15V		30		ns
$t_{d(off)}$	I_{Cnom} = 15 A, T_j = 150 °C		155		ns
t_f	R_{Gon} = R_{Goff} = 22 Ω		45		ns
E_{on} (E_{off})	inductive load		0,6 (0,5)		mJ
Diode - Inverter					
V_F = V_{EC}	I_F = 15 A, T_j = 25 (150) °C		1,4 (1,4)	1,7 (1,7)	V
$V_{(TO)}$	T_j = 25 (150) °C		1 (0,9)	1,1 (1)	V
r_T	T_j = 25 (150) °C		27 (34)	40 (47)	mΩ
$R_{th(j-s)}$	per diode		2,5		K/W
I_{RRM}	under following conditions		20		A
Q_{rr}	I_{Fnom} = 15 A, V_R = 300 V		1,8		µC
E_{rr}	V_{GE} = 0 V, T_j = 150°C		0,5		mJ
	di_F/dt = 930 A/µs				
Diode - Rectifier					
V_F	I_{Fnom} = 15 A, T_j = 25 °C		1,1		V
$V_{(TO)}$	T_j = 150 °C		0,8		V
r_T	T_j = 150 °C		20		mΩ
$R_{th(j-s)}$	per diode		1,5		K/W
Temperature Sensor					
R_{ts}	3 %, T_r = 25 (100) °C		1000(1670)		Ω
Mechanical Data					
w			21,5		g
M_s	Mounting torque	2		2,5	Nm

 © by SEMIKRON

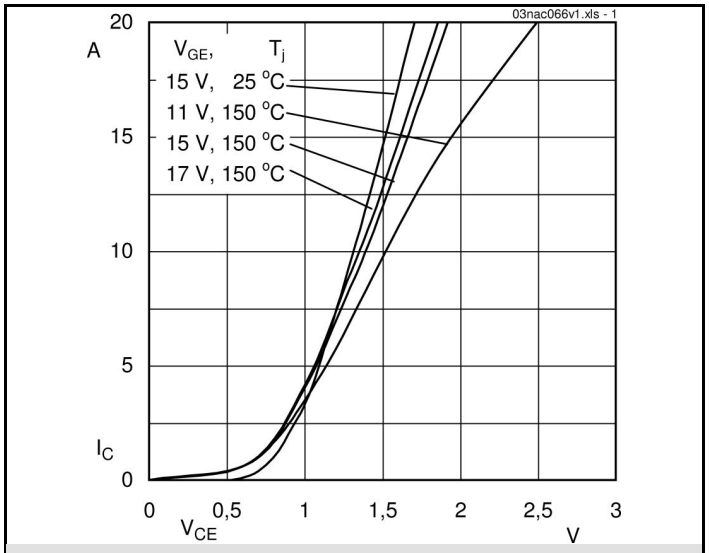


Fig. 1 Typ. output characteristics

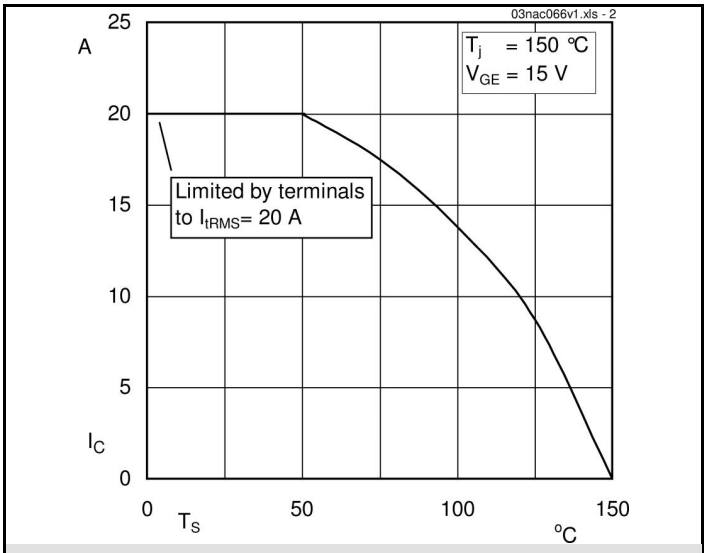


Fig. 2 Typ. rated current vs. temperature

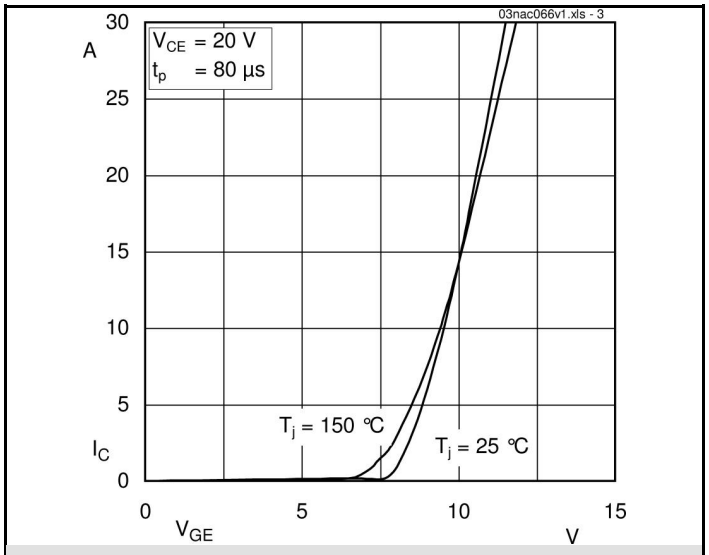


Fig. 3 Typ. transfer characteristic

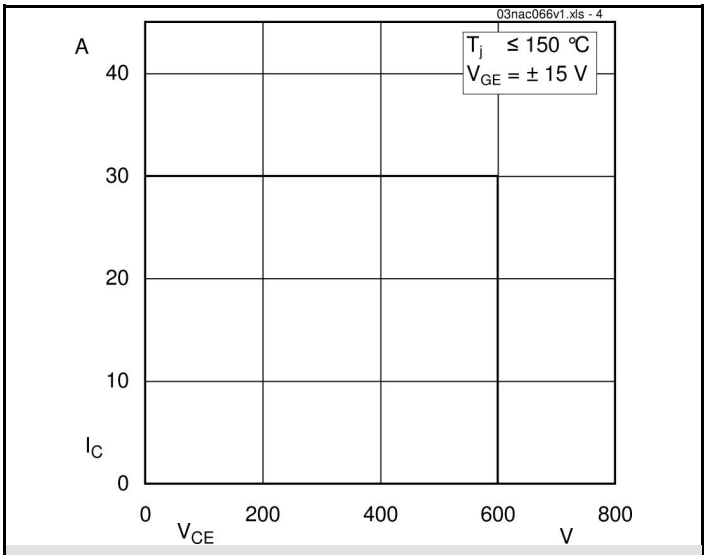


Fig. 4 Reverse bias safe operating area

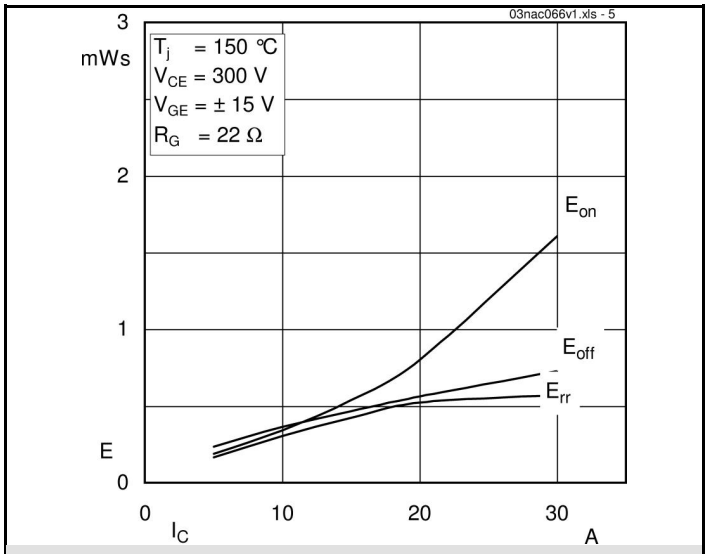


Fig. 5 Typ. Turn-on/-off energy = f (I_C)

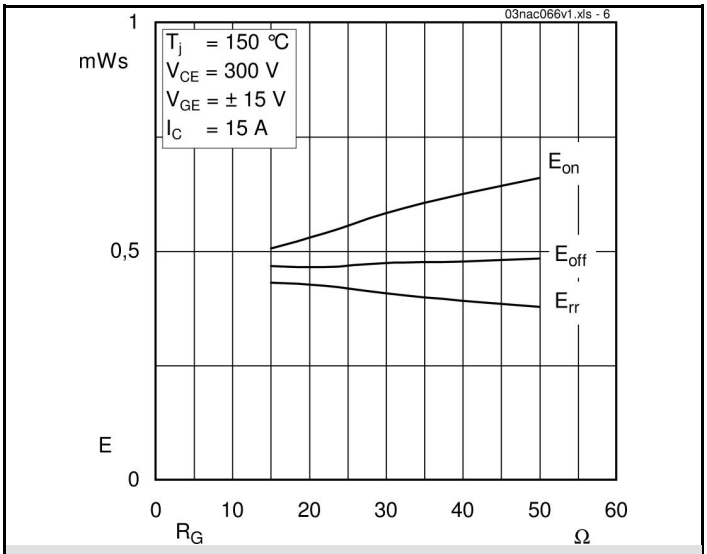


Fig. 6 Typ. Turn-on/-off energy = f (R_G)

 © by SEMIKRON

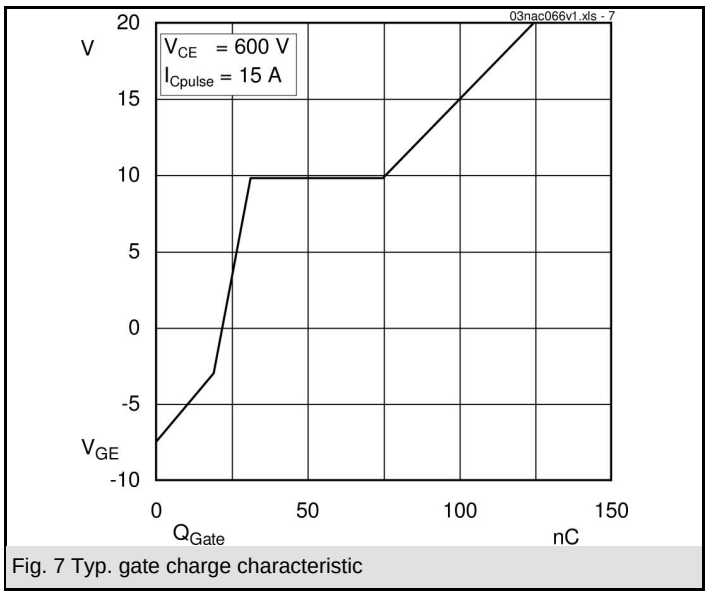


Fig. 7 Typ. gate charge characteristic

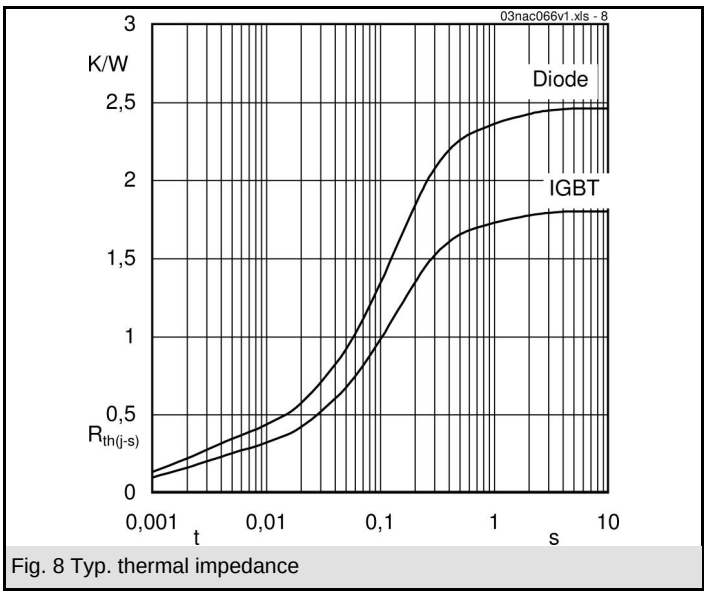


Fig. 8 Typ. thermal impedance

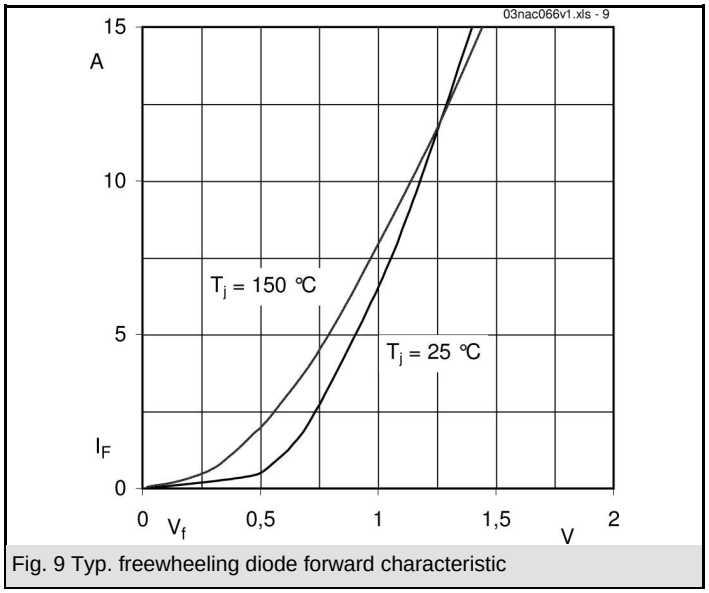


Fig. 9 Typ. freewheeling diode forward characteristic

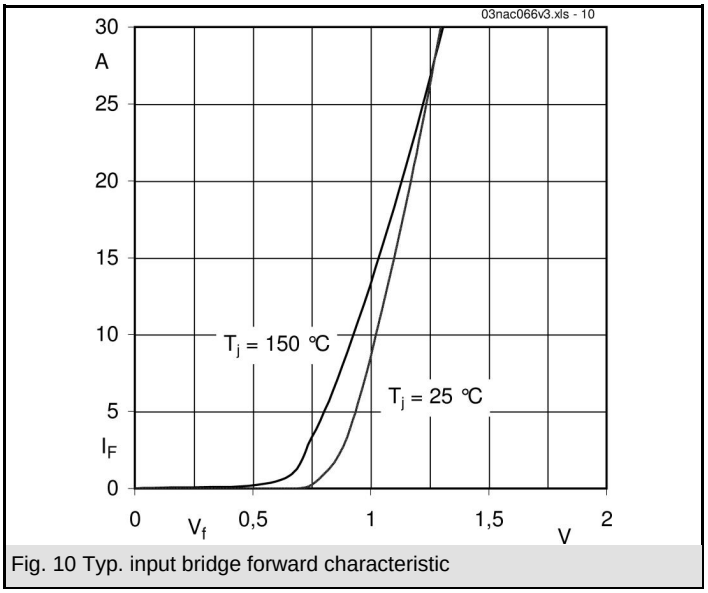
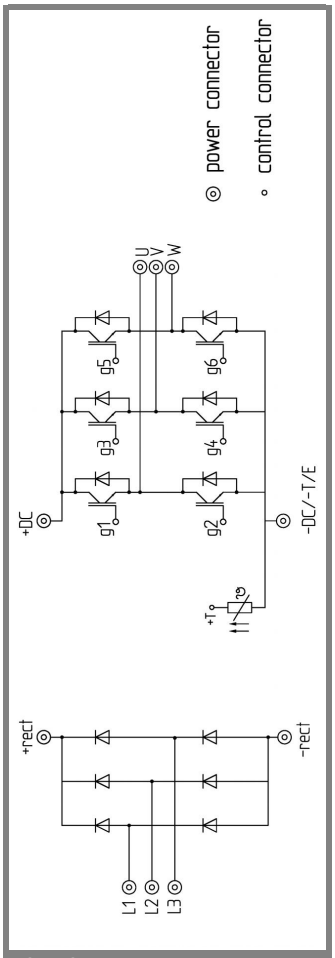
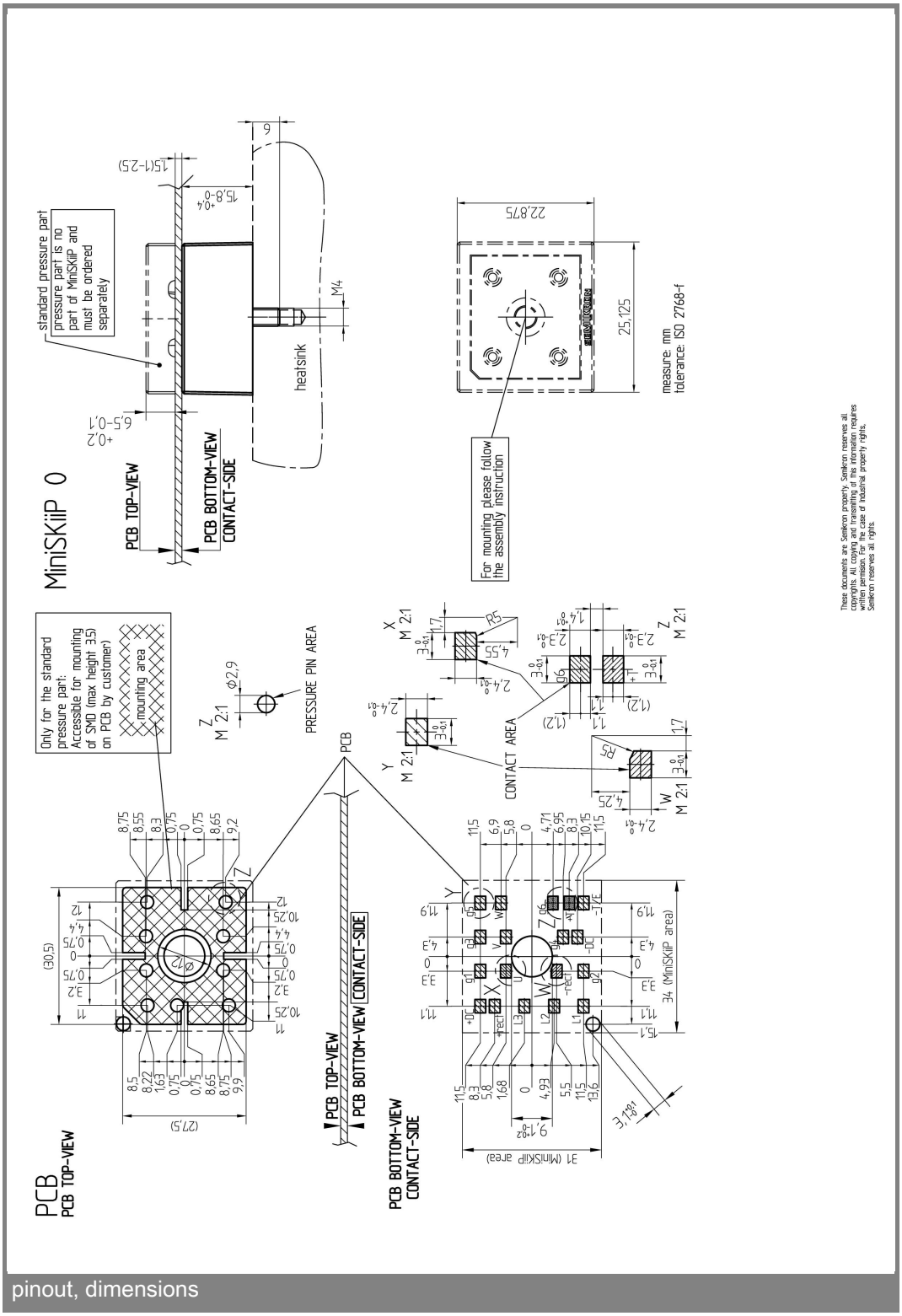


Fig. 10 Typ. input bridge forward characteristic

 © by SEMIKRON



circuit



pinout, dimensions

These documents are Semikron property. Semikron reserves all rights, including all rights of translation, reproduction by any method, modification, distribution and the like. Any use for commercial purposes without permission, in the case of industrial property rights, Semikron reserves all rights.

This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

This technical information specifies semiconductor devices but promises no characteristics. No warranty or guarantee expressed or implied is made regarding delivery, performance or suitability.